IN THE SPECIFICATION:

Please amend the specification as follows:

Please substitute the paragraph beginning at page 1, line 8, with the following.

A2

-- The present invention relates to an exposure apparatus, a coating/developing system, a device manufacturing system, a device manufacturing method, a semiconductor manufacturing factory, and an exposure apparatus maintenance method that are used to manufacture a semiconductor element and the like. --

Please substitute the paragraph beginning at page 1, line 16, and ending on page 2, line 3, with the following.

A3

-- Exposure light of an exposure apparatus is decreasing in wavelength in order to increase the resolution of a projection optical system and to expose a wafer to a finer pattern. For example, in exposure with a short wavelength of KrF or the like as represented by a fluorine excimer laser, a coater/developer (Coating/Developing System: CDS) for coating a wafer to be exposed with a resist and developing the exposed wafer is generally connected in line to an exposure apparatus. This is because a resist poor in chemical resistance is used and degraded by ammonia or the like, influencing the quality of an exposed image. In-line connection is, therefore, adopted to shorten the time after coating and to keep the wafer in a predetermined controlled environment. --

Please substitute the paragraph beginning at page 2, line 4, with the following.

-- Fig. 16 schematically shows a conventional semiconductor manufacturing system adopting an in-line connection. --

Please substitute the paragraph beginning at page 2, line 24, and ending on page 3, line 22, with the following.

-- If a wafer subjected to circuit pattern formation is loaded into the CDS 51 (step 101), the wafer is coated with a resist by a resist coating unit 51a of the CDS 51 (step 102). The wafer is temporarily heated to a high temperature (pre-baked) by a heating unit 51b (step 103), and cooled by a cooling unit 51c (step 104). The wafer passes through the interface 53 (step 105), and is transported to the exposure apparatus 52 (step 106). The wafer loaded into the exposure apparatus 52 is pre-aligned by the pre-alignment unit 55 (step 107), and set on the wafer stage 56. The wafer is aligned with the reticle by the wafer stage 56 of the exposure apparatus 52 (step 108), and is exposed to a predetermined integrated circuit image (step 109). The exposed wafer is returned to the CDS 51 via the interface 53. The wafer is heated to a high temperature (post exposure bake; to be referred to as PEB hereinafter) by a heating/cooling unit 51d of the CDS 51 (step 110), cooled (step 111), and then developed by a developing unit 51e (step 112). The time ~~till~~ until developing processing after exposure also greatly influences chemical changes of the resist. After developing processing, the wafer is unloaded from the CDS 51 via a heating unit 51f and cooling unit 51g (step 113), and transported to other processing apparatuses. --

Please substitute the paragraph beginning at page 3, line 23, and ending on page 4, line 1, with the following.

-- In the above process, the wafer is always kept in a predetermined clean environment. Particularly, when the wafer is set in the same environment as that of the developer or coater in the CDS, the cleanliness decreases. To set a wafer in a very clean environment, the cost inevitably rises. --

Please substitute the paragraph beginning at page 4, line 2, with the following.

-- Further, the recent trend of low chemical resistance of a resist leads <u>to</u> a stricter cleanliness standard. --

Please substitute the paragraph beginning at page 5, line 14, with the following.

-- In the present invention, the port section desirably comprises a temperature control mechanism for controlling a temperature of the wafer. The temperature control mechanism desirably comprises a heater for heating the wafer and/or a cooler for cooling the wafer. The heater heats a wafer and/or <u>an</u> exposed wafer. The cooler cools a heated wafer. The temperature control mechanism can perform temperature control such as heating of the wafer while an internal atmosphere of the port section is set close to an internal atmosphere of the exposure apparatus. For example, the wafer is desirably heated while gas in the port section is exhausted, and cooled while gas is supplied to the port section. --

Please substitute the paragraph beginning at page 6, line 22, and ending on page 7, line 6, with the following.

-- According to the present invention, a wafer processing method is characterized by comprising the steps of coating a wafer with a resist or an anti-reflective agent, heating the wafer, and exhausting an ambient atmosphere of the wafer before heating of the wafer ends. The wafer processing method preferably further comprises the step of supplying gas around the wafer after an ambient atmosphere of the wafer is exhausted. More preferably, the wafer processing method further comprises the step of cooling the heated wafer before the step of supplying gas around the wafer ends. --

A9

Please substitute the paragraph beginning at page 9, line 20, with the following.

-- Particularly, in the first port section for loading a wafer, the substance around the wafer can be exhausted in heating by controlling to set a vacuum (low-pressure) atmosphere during wafer heating and purging the atmosphere by inert gas in cleaning. The impurity concentration in the chamber mechanism can be reduced, achieving high purge performance. --

A10

Please substitute the paragraph beginning at page 10, line 20, and ending on page 11, line 13, with the following.

-- According to the present invention, a device manufacturing method is characterized by comprising the steps of installing manufacturing apparatuses for performing various processes including the exposure apparatus and CDS in a semiconductor manufacturing factory, and

A11

manufacturing a semiconductor device by using the manufacturing apparatuses in a plurality of processes. The device manufacturing method may further comprise the steps of connecting the manufacturing apparatuses by a local area network, and communicating information about at least one of the manufacturing apparatuses between the local area network and an external network outside the semiconductor manufacturing factory. In addition, a database provided by a vendor or user of the exposure apparatus may be accessed via the external network to obtain maintenance information of the manufacturing apparatus by data communication, or production management may be performed by data communication between the semiconductor manufacturing factory and another semiconductor manufacturing factory via the external network. --

A11 cont'd

Please substitute the paragraph beginning at page 11, line 14, with the following.

-- A semiconductor manufacturing factory according to the present invention comprises manufacturing apparatuses for performing various processes including the exposure apparatus and CDS of the present invention, a local area network for connecting the manufacturing apparatuses, and a gateway which allows the local area network to access an external network outside the factory, wherein information about at least one of the manufacturing apparatuses can be communicated. --

A12

Please substitute the paragraph beginning at page 12, line 15, with the following.

-- Fig. 1 is a schematic, sectional view showing an example of a semiconductor exposure apparatus using an F_2 excimer laser as a light source according to the present invention; --

A13

Please substitute the paragraph beginning at page 14, line 10, with the following.

-- Fig. 16 is a schematic view showing a conventional semiconductor manufacturing system adopting an in-line connection; --

A14

Please substitute the paragraph beginning at page 15, line 5, with the following.

-- Fig. 1 is a schematic, sectional view showing an example of a semiconductor exposure apparatus using an F_2 excimer laser as a light source according to the present invention. --

A15

Please substitute the paragraph beginning at page 18, line 9, with the following.

-- The interface 24 has the same mechanism as the load-lock mechanism. In this case, the interface 24 comprises a door disposed on the CDS 22 side, doors disposed on the sides of the in-line port sections 25 and 26, an exhaust pump for exhausting the internal gas of the interface 24, and a supply mechanism for supplying an atmospheric gas into the interface in order to set the internal atmosphere of the interface to be the same as that of the port sections 25 and 26. In transferring a wafer to the in-line port sections 25 and 26, the internal atmosphere of the interface 24 is set to be almost the same as that of the in-line port sections 25 and 26. --

A16

Please substitute the paragraph beginning at page 23, line 4, with the following.

-- Fig. 5 is a schematic, sectional view showing the in-line port section 32 in Fig. 4 taken along the line A - A′. In Fig. 5, reference numeral 42 denotes a wafer to be transferred; 43, a supply pipe for supplying N_2 gas as inert gas to the in-line port section 32; 44, an exhaust pipe for evacuating the interior of the in-line port section or reducing its internal pressure; 45a, a door attached to the in-line portion section 32 on the CDS 30 side; and 45b, a door attached to the in-line port section 32 on the exposure apparatus 31 side. When these doors are closed, the in-line port section is sealed. Reference numeral 46 denotes a cooling plate for cooling the wafer 42; 47, a Peltier element; 48, a hot plate for heating the wafer 42; 49, a heater; and 50, a wafer hand for transferring the wafer 42 within the in-line port section 32. --

A17

Please substitute the paragraph beginning at page 29, line 21, and ending on page 30, line 7, with the following.

-- The above-described wafer processing does not use the in-line port section 38 which incorporates the wafer heating/cooling unit 38a. This port section is used to successively process a plurality of wafers. That is, when a wafer is exposed, the port section 37 remains in the internal atmosphere of the exposure apparatus 36, and the next wafer cannot be loaded. If, however, the in-line port section 38 is used, a wafer can be loaded <u>in</u> parallel, which enables successively processing a plurality of wafers without any standby time. Supply of a wafer to the in-line port section 37 or 38 and recovery of a wafer from the in-line port section 37 or 38 are performed by the transfer hand 60 on the basis of signals from the controller (not shown). --

A18

Please substitute the paragraph beginning at page 30, line 8, with the following.

A19

-- The third embodiment adopts two in-line port sections, but the present invention is not limited to this. For example, three or more in-line port ~~section~~ sections may be arranged. --

Please substitute the paragraph beginning at page 33, line 24, with the following.

A20

-- In the embodiments of Figs. 4 to 7, heating and cooling are done in the load-lock chamber. Even in the step including BARC and TARC, heating/cooling ~~in~~ after resist coating may be done in the load-lock chamber. --

Please substitute the paragraph beginning at page 34, line 5, with the following.

A21

-- The semiconductor manufacturing system of the fourth embodiment is the same as that of the third embodiment except that in-line port sections 40a and 40b for transporting a wafer to an exposure apparatus 39 have only a load-lock function and heating/cooling units 41a and 41b serving as a wafer temperature controller are arranged in the exposure apparatus 39 near the port sections 40a and 40b. The heating/cooling units 41a and 41b are in the purge environment of the exposure apparatus 39, but return gas from these units passes through another circulation system. Alternatively, the heating/cooling units 41a and 41b may use a temperature adjustment/purge system different from that of the exposure apparatus 39 or may exhaust return gas. For this purpose, the semiconductor manufacturing system comprises an atmosphere around the temperature controllers, other than an air-conditioner (not shown) for a purge environment. --

Please substitute the paragraph beginning at page 35, line 6, with the following.

A22

-- In the fourth embodiment, processing from wafer loading into a CDS 35 (step 301) up to wafer unloading to the in-line port section 40a (step 303) is the same as that in the third embodiment. --

Please substitute the paragraph beginning at page 37, line 7, with the following.

A23

-- Fig. 15 is a schematic, sectional view showing another example of a semiconductor exposure apparatus using an F_2 excimer laser as a light source according to the present invention. --

Please substitute the paragraph beginning at page 38, line 10, with the following.

A24

-- A production system for producing a semiconductor device (e.g., a semiconductor chip such as an IC or LSI, a liquid crystal panel, a CCD, a thin-film magnetic head, a micromachine, or the like) will be exemplified. A trouble remedy or periodic maintenance of a manufacturing apparatus installed in a semiconductor manufacturing factory, or maintenance service such as software distribution is performed by using a computer network outside the manufacturing factory. --

Please substitute the paragraph beginning at page 38, line 19, and ending on page 39, line 15, with the following.

-- Fig. 18 shows the overall system cut out at a given angle. In Fig. 18, reference numeral 101 references a business office of a vendor, (e.g., an apparatus supply manufacturer), which provides a semiconductor device manufacturing apparatus. Assumed examples of the manufacturing apparatus are semiconductor manufacturing apparatuses for performing various processes used in a semiconductor manufacturing factory, such as pre-process apparatuses (e.g., a lithography apparatus including an exposure apparatus, a resist processing apparatus, and an etching apparatus, an annealing apparatus, a film formation apparatus, a planarization apparatus, and the like) and post-process apparatuses (e.g., an assembly apparatus, an inspection apparatus, and the like). The business office 101 comprises a host management system 108 for providing a maintenance database for the manufacturing apparatus, a plurality of operation terminal computers 110, and a LAN (Local Area Network) 109, which connects the host management system 108 and computers 110, to build an intranet. The host management system 108 has a gateway for connecting the LAN 109 to Internet 105 as an external network of the business office, and a security function for limiting external ~~accesses~~ access. --

A25

Please substitute the paragraph beginning at page 39, line 16, and ending on page 41, line 2, with the following.

-- Reference numerals 102 to 104 denote manufacturing factories of the semiconductor manufacturer as users of manufacturing apparatuses. The manufacturing factories 102 to 104 may belong to different manufacturers or the same manufacturer (e.g., a pre-process factory, a post-process factory, and the like). Each of the factories 102 to 104 is equipped with a plurality

A26

of manufacturing apparatuses 106, a LAN (Local Area Network) 111, which connects these apparatuses 106 to construct an intranet, and a host management system 107 serving as a monitoring apparatus for monitoring the operation status of each manufacturing apparatus 106. The host management system 107 in each of the factories 102 to 104 has a gateway for connecting the LAN 111 in the factory to the Internet 105 as an external network of the factory. Each factory can access the host management system 108 of the vendor 101 from the LAN 111 via the Internet 105. The security function of the host management system 108 authorizes access of only a limited user. More specifically, the factory notifies the vendor via the Internet 105 of status information (e.g., the symptom of a manufacturing apparatus in trouble) representing the operation status of each manufacturing apparatus 106, and receives response information (e.g., information designating a remedy against the trouble, or remedy software or data) corresponding to the notification, or maintenance information such as the latest software or help information. Data communication between the factories 102 to 104 and the vendor 101 and data communication via the LAN 111 in each factory adopt a communication protocol (TCP/IP) generally used in the Internet. Instead of using the Internet as an external network of the factory, a dedicated network (e.g., an ISDN) having high security, which inhibits access of a third party can be adopted. Also, the user may construct a database in addition to the one provided by the vendor and set the database on an external network, and the host management system may authorize access to the database from a plurality of user factories. --

A26

Please substitute the paragraph beginning at page 41, line 3, and ending on page 42, line 23, with the following.

-- Fig. 19 is a view showing the concept of the overall system of this embodiment that is cut out at a different angle from Fig. 18. In the above example, a plurality of user factories having manufacturing apparatuses and the management system of the manufacturing apparatus vendor are connected via an external network, and production management of each factory or information of at least one manufacturing apparatus is communicated via the external network. In the example of Fig. 19, a factory having manufacturing apparatuses of a plurality of vendors and the management systems of the vendors for these manufacturing apparatuses are connected via the external network of the factory, and maintenance information of each manufacturing apparatus is communicated. In Fig. 19, reference numeral 201 denotes a manufacturing factory of a manufacturing apparatus user (e.g., a semiconductor device manufacturer) where manufacturing apparatuses for performing various processes, e.g., an exposure apparatus 202, a resist processing apparatus 203, and a film formation apparatus 204 are installed in the manufacturing line of the factory. Fig. 19 shows only one manufacturing factory 201, but a plurality of factories are networked in practice. The respective apparatuses in the factory are connected to a LAN 206 to build an intranet, and a host management system 205 manages the operation of the manufacturing line. The business offices of vendors (e.g., apparatus supply manufacturers) such as an exposure apparatus manufacturer 210, a resist processing apparatus manufacturer 220, and a film formation apparatus manufacturer 230 comprise host management systems 211, 221, and 231 for executing remote maintenance for the supplied apparatuses. Each

A27

host management system has a maintenance database and a gateway for an external network, as described above. The host management system 205 for managing the apparatuses in the manufacturing factory of the user, and the management systems 211, 221, and 231 of the vendors for the respective apparatuses are connected via the Internet or dedicated network serving as an external network 200. If ~~a~~ trouble occurs in any one of a series of manufacturing apparatuses along the manufacturing line in this system, the operation of the manufacturing line stops. This trouble can be quickly solved by remote maintenance from the vendor of the apparatus in trouble via the Internet 200. This can minimize the ~~stop~~ <u>stoppage</u> of the manufacturing line. --

A27 Contd

Please substitute the paragraph beginning at page 42, line 24, and ending on page 43, line 24, with the following.

-- Each manufacturing apparatus in the semiconductor manufacturing factory comprises a display, a network interface, and a computer for executing network access software and apparatus operating software which are stored in a storage device. The storage device is a built-in memory, hard disk, or network file server. The network access software includes a dedicated or general-purpose web browser, and provides a user interface having a window as shown in Fig. 20 on the display. While referring to this window, the operator who manages manufacturing apparatuses in each factory inputs, in input items on the windows, pieces of information (401), serial number (402), subject of trouble (403), occurrence date (404), degree of urgency (405), symptom (406), remedy (407), and progress (408). The pieces of input information are transmitted to the maintenance database via the Internet, and appropriate maintenance information is sent back

A28

from the maintenance database and displayed on the display. The user interface provided by the web browser realizes hyperlink functions (410 to 412), as shown in Fig. 20. This allows the operator to access detailed information of each item, to receive the latest-version software to be used for a manufacturing apparatus from a software library provided by a vendor, and to receive an operation guide (help information) as a reference for the operator in the factory. --

A28 Cont'd

Please substitute the paragraph beginning at page 43, line 25, and ending on page 44, line 25, with the following.

-- A semiconductor device manufacturing process using the above-described production system will be explained. Fig. 21 shows the flow of the whole manufacturing process of the semiconductor device. In step 1 (circuit design), a semiconductor device circuit is designed. In step 2 (mask formation), a mask having the designed circuit pattern is formed. In step 3 (wafer manufacture), a wafer is manufactured by using a material such as silicon. In step 4 (wafer process), called a pre-process, an actual circuit is formed on the wafer by lithography using a prepared mask and the wafer. Step 5 (assembly), called a post-process, is the step of forming a semiconductor chip by using the wafer manufactured in step 4, and includes an assembly processing (dicing and bonding) and a packaging process (chip encapsulation). In step 6 (inspection), inspections such as the operation confirmation test and durability test of the semiconductor device manufactured in step 5 are conducted. After these steps, the semiconductor device is completed and shipped (step 7). For example, the pre-process and post-process are performed in separate dedicated factories, and maintenance is done for each of the

A29

factories by the above-described remote maintenance system. Information for production management and apparatus maintenance is communicated between the pre-process factory and the post-process factory via the Internet or dedicated network. --

A29 cont'd

Please substitute the paragraph beginning at page 44, line 26, and ending on page 45, line 21, with the following.

A30

-- Fig. 22 shows the detailed flow of the wafer process. In step 11 (oxidation), the wafer surface is oxidized. In step 12 (CVD), an insulating film is formed on the wafer surface. In step 13 (electrode formation), an electrode is formed on the wafer by vapor deposition. In step 14 (ion implantation), ions are implanted on the wafer. In step 15 (resist processing), a photosensitive agent is applied to the wafer. In step 16 (exposure), the above-mentioned exposure apparatus exposes the wafer to the circuit pattern of a mask. In step 17 (developing), the exposed wafer is developed. In step 18 (etching), the resist is etched except for the developed resist image. In step 19 (resist removal), an unnecessary resist after etching is removed. These steps are repeated to form multiple circuit patterns on the wafer. A manufacturing apparatus used in each step undergoes maintenance by the remote maintenance system, which prevents a trouble in advance. Even if a trouble occurs, the manufacturing apparatus can be quickly recovered. The productivity of the semiconductor device can be increased in comparison with the prior art. --